

Mussel Mayhem Prevention

A Dispatch from Lake Berryessa

They're small, easily fitting on the surface of a quarter, non-descript as individuals, nightmarish as a group. A phenomenal reproductive rate and an ability to completely overwhelm an environment, making them a lurking menace, a threat that an active imagination could not exaggerate. From the depths of infested lakes and rivers they spread, covering any suitable surface, leapfrogging (with help), over dry land to invade new aquatic habitats. They change each new home they occupy, chemically altering the water, lowering oxygen levels, generating toxic byproducts such as botulism and causing fish and birds to die. People and the fabrics of modern life; boats, docks and dams, are assaulted by their onslaught and seeming disrespect for all things "permanent".

The quagga and zebra mussels have made it to the Pacific hinterlands, presenting a unique challenge to The Bureau of Reclamation, an agency charged with "*Managing Water in the West*". In January of 2007, National Park Service volunteer, Wen Balwin, discovered quagga mussels in Lake Mead, the first such report of the invasive mussel in a water body west of the Rocky Mountains. According to Wen, the mussels could have been introduced into the lake many years before and gone unnoticed because of the quagga's tendency to occupy deep, cold substrates initially. As their population expands, however, they move into shallow waters, becoming more apparent and even out-competing the zebra mussel where the two species occur together. No one knows exactly when or how the first mussels made it into Lake Mead but they were probably attached to an infested boat or boat trailer coming west during a period of cool moist air when mussels can survive out of the water for a longer time. Since the initial quagga identification in Lake Mead, over thirty water systems in California, Arizona, Nevada and Utah have been impacted, including the Colorado River Aqueduct System.

The large and impressive lakes and reservoirs of Northern California would be the logical next step on the "mussel mayhem march." Surprisingly, the zebra mussel, not the quagga has been the first to appear in the Northern half of the state, now occupying, since early 2008, a small Reclamation managed reservoir named San Justo near Monterey (the only water body in the far west in which the zebra mussel species occurs). With the quick spread of the mussels, particularly the quagga, through California in the last couple years, it would seem inevitable that places like Clear Lake, Shasta, Tahoe and Lake Berryessa will be infested soon. "Inevitability", though, is not a term that Reclamation or Lake Berryessa resource managers choose to adopt. In fact, the state of Minnesota, over the last couple of decades, has effectively limited the spread of zebra mussels to just a few lakes outside of the Mississippi River corridor. Being proactive in prevention helps to maintain the integrity, recreational and resource value of a lake for as long as possible, giving time for solutions to develop, especially in the treatment of infested lakes. On a promising note; a new bio-pesticide derived from a soil bacterium is being tested and showing favorable, "lethal" results controlling the two invasive mussel species. Please keep your fingers crossed!

Berryessa is a beautiful lake, with 165 miles of shoreline, tucked away into the interior folds of the Coast Range, northeast of the San Francisco Bay area. Keeping this valuable fishing, boating, swimming, wildlife, and community water source free of mussels is the aim of a mussel awareness/intervention program which began in the spring of 2008 at Reclamation managed Lake Berryessa. This program is a "three-pronged" approach entailing: (1) **Monitor** the Lake with plankton

nets and suspended substrate plates to detect any presence of mussel larvae; (2) **Screen** watercraft at marinas and boat launch ramps to help prevent mussel introduction; (3) **Educate** visitors to the Lake as a means of promoting overall mussel awareness.

Monitoring the lake for veligers (the free-floating, plankton stage of the mussels) and early detection of young individuals attached to substrate has been the task of Natural Resource Specialists, water agencies, and other resource personnel within the Mid-Pacific Region of Reclamation. Specialists head out onto Lake Berryessa throughout the year, checking sampling plates, ever hopeful nothing will be detected.

Screening of watercraft for mussels takes place at the concession operated marinas and boat launch ramps. The screening process, as performed by park rangers at Capell Cove Boat Launch, entails:

- (1) Talking with watercraft owners to determine where and when they last launched.
- (2) Issuing "Weekend Passes" to recreate on Lake Berryessa when it has been determined the watercraft/trailer has not launched into a mussel infested lake within the last 30 days.
- (3) Inspecting watercraft/trailers if the initial visitor contact determine possible mussel contamination (i.e. within the 30 day window).

If mussels are present or the ranger suspects a possibility, visitors are directed to contact the California Department of Fish and Game (DFG), from whom they'll receive information on decontamination procedures. Visitors wishing to launch a suspected vessel will not be permitted to launch.

Reclamation staff track visitor contacts and the number of "Weekend Passes" issued on a chart which includes watercraft CF number, information on whether an inspection was performed and, if so, whether the vessel passed. This information, as well as a detailed inspection form, is archived within Reclamation and shared with California Department of Fish and Game.

Educating the public on the mussel threat through signage, brochures, illustrative displays and direct contact is actively pursued at Lake Berryessa. For example, concurrent with watercraft screening, park rangers engage visitors, emphasizing the serious nature of the threat and the actions needed to safeguard the lake. 2008 summer seasonal ranger, Tina Schuett, dramatically pointed-out one troubling thought and reason to keep the lake mussel free: *"In my home state of Wisconsin, you can't walk the beaches of some lakes because razor sharp mussel fragments litter the shoreline, slicing both the feet of people and dogs."*

Through monitoring, screening and education the Bureau of Reclamation at Lake Berryessa is striving to stay ahead of the mussel mayhem. For more information about the mussel awareness/intervention program at Lake Berryessa, please visit:

<http://www.usbr.gov/mp/cao/berryessa/nat-res-mgmt-act.html> or call Juliet Gifford at 707-966-2111 ext 103 jgifford@usbr.gov

For more information on Quagga and Zebra mussels, including a list of infested lakes, visit the California Department of Fish and Game website at: <http://www.dfg.ca.gov/invasives/quaggamussel/>